UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER OF
PATENTS AND TRADEMARKS
Washington, D.C. 20231

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Paper No. 9

Serial Number: 08/066,996
Filing Date: May 24, 1993
Appellant(s): Holland et al.

David B. Murphy
For Appellant

EXAMINER'S ANSWER

This is in response to appellants' brief on appeal filed March 21, 1995.

(1) *Status of claims.*

The statement of the status of claims contained in the brief is correct.

(2) *Status of Amendments After Final.*

The amendment(s) after final rejection filed on March 21, 1995 have been entered.

(3) *Summary of invention.*

The summary of invention contained in the brief is correct.

(4) *Issues.*

The appellants' statement of the issues in the brief is correct.

(5) *Grouping of claims.*

The rejection of claims 1-20 stand or fall together because appellants' brief does not include a statement that this grouping of claims does not stand or fall together. See 37 C.F.R. § 1.192(c)(5).

(6) *Claims appealed.*

The copy of the appealed claims contained in the Appendix is correct.

(7) *Prior Art of record.*

Number	Name	Date
U.S. Patent No. 4,312,017	Poetsch	Jan. 19, 1982
U.S. Patent No. 4,270,150	Diermann et al.	May 26, 1981

(8) *New prior art.*

No new prior art has been applied in this examiner's answer.

(9) *Grounds of rejection.*

The following grounds of rejection are applicable to the appealed claims.

Claims 1-20 are rejected under 35 U.S.C. § 103 as being unpatentable over Poetsch (U.S. Patent No. 4,312,017) in view of Diermann et al. (U.S. Patent No. 4,270,150). Regarding Claim 1, Poetsch discloses a method for converting a two-to-one anamorphic film image into a video output signal having multiple video output lines comprising the steps of scanning the film image in a progressive scan, each scan comprising a scan line, using the non-anamorphic spacing between scan lines (Column 1, Lines 44-55), storing the scan lines in memory (Column 1, Lines 56-57), and forming a video output line (Figure 1, Item 18). Poetsch does not disclose the specifics of the processing of the video data according to the steps claimed in the instant invention. However, Diermann et al. disclose producing a TV signal by processing stored image data, forming output video lines wherein for the first video output line a first scan line is combined with two scan lines adjacent to the first scan line (Column 75, Lines 48-50), the three scan lines being successive scan lines of a field (Column 13, Lines 15-16). Thus it is obvious that for subsequent video output lines the combining of scan lines takes place such that a subsequent scan line will differ from the previous scan line by 2n scan lines, where n equals 1 for a progressive output or 2 for an interlaced output. It is also obvious that in order to create a full reproduction of the film image the processing of the image data

must continue until the image is formed into the video output signal. It is well known that special video processing techniques are required in order to provide adequate corrected and/or enhanced video reproductions of scanned film images. Among the known and accepted practices for such processing is the combining of scan lines to produce interpolations that correct and/or enhance the reproduced image. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of Diermann et al. for the combining of scan lines in the system of Poetsch to correct and/or enhance the video image data derived from scanning a film image.

Regarding Claims 2-5, Poetsch does not disclose the claimed method for weighting of the scan lines. However, Diermann et al. discloses the combining of scan lines which includes weighting of the scan lines wherein the weighting is unequal and is substantially 1/2 for the scan line and substantially 1/4 for each of the two adjacent lines (Column 73, Lines 20-25). Diermann et al. do not disclose a weighting of the scan lines such that the weighting of each line is substantially equal. However, it is well known that in methods used to convert film images to video, a wide variety of techniques for combining video scan lines can be applied in order to accomplish the desired image correction and/or enhancement. Among those techniques is that of weighting the various lines which are combined, as disclosed in the

Diermann et al. reference. It is well known that the specific weighting factors used can be of any desired value to produce a particular image quality. Thus, the weighting of scan lines can be such that each weight is substantially equal or can take on any other set of weighting values as desired. The Applicants admit that the weights used in any particular processing scheme is a matter of design choice and may be varied at the user's discretion (See Page 7, Lines 32-33 and Page 8, Lines 1-7 of the disclosure). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to apply a weighting methodology such as disclosed by Diermann et al. in the method of Poetsch to correct and/or enhance video data derived by scanning a film image. Furthermore, it would have been obvious that any desired set of weighting factors may be used, including equal and unequal weighting factors. Thus, in the absence of any teaching regarding the criticality of choosing equal weighting as opposed to unequal weighting, it is considered that a substantially equal weighting of the scan lines would have been a matter of design choice at the time of the invention.

Regarding Claims 6-8, Poetsch discloses a method and system to scan a film image in order to derive television signals in standard television interlace scanning format wherein a first and second interlaced field are formed (See Abstract). Poetsch does not disclose the claimed combining of video scan lines. However,

as mentioned with regard to Claim 1, the combining of subsequent scan lines is well known as a procedure for processing the image scan lines in systems that are used for converting film images to video. It is obvious that for displaying the resultant image on television, the video output lines produced by this method must be output in an interlaced format wherein a first and second interlaced field are formed since such interlacing is standard for television signals. Furthermore, it is inherent in processing video for television formatting, that when three scan lines are combined such as in the design of Diermann et al. the first scan line of the second interlaced field must be two lines offset from the first scanned line in the first field. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention, in combining three scan lines into one, that the first scan line of the second interlaced field must be two lines offset from the first scanned line in the first field in order for the resultant signal to be useable in the standard television interlaced field format.

Regarding Claim 9, Poetsch discloses a method for scanning film comprising the steps of scanning the film in m-scan lines of a progressive raster scan. As the film frame is scanned, line by line, each line is assigned an address and the signals are stored in memory (Column 1, Lines 53-60). Data thus derived and stored is available for output in any desirable configuration. Poetsch

discloses that scanning can be progressive or anamorphic (See Abstract). Although the anamorphic mode of Poetsch is accomplished by a change in scanning, the data obtained by the progressive scanning mean of Poetsch could easily be used to recreate an anamorphic image by generating a video output consisting of n active scan lines wherein m is at least twice n. This would enable the multi-mode feature of Poetsch to be accomplished without having to change the scanning method. It is well known, as admitted by the Applicants (See Page 6, Lines 17-22 of the disclosure) that the spacing between scan lines is twice as great for anamorphic images as that between scan lines of a progressive scan. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a means in the progressive scanning method of Poetsch for generating a video output consisting of n active scan lines wherein the number of total scan lines available for processing is twice the number of scan lines output thus enabling the device of Poetsch to function in an anamorphic mode without requiring a change in the scanning process. Furthermore, although Poetsch does not disclose the combining of scan lines as claimed in the instant invention, Diermann et al. disclose combining of a first main scan line with one or more nearby scan lines to form a first video output line and the forming of a next video output line by combining a second main scan line with yet another nearby scan

line where the first main scan line and the second main scan line are not adjacent and repeating the preceding step (Column 73, Lines 20-25). As described in accordance with claim 1, it is well known in the art that the combining of scan lines provides corrective and/or enhancing processing of the video data in a way that improves the performance of systems that convert film images to video. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use, in the system of Poetsch, the method of Diermann et al. for combining scan lines and combining them in such a way that a first main scan line is combined with one or more nearby scan lines to form a first video output line, and a next video output line is formed by combining a second scan line with another nearby scan line where the first and second main scan lines are not adjacent, thereby correcting and/or enhancing the video image derived from the scanning process.

Regarding Claims 10-14, the method of Diermann et al. in combining scan lines uses two scan lines that are adjacent to main scan lines wherein the combined scan lines are unequally weighted. Diermann et al. do not disclose an equal weighting of the scan lines involved. However, as mentioned in accordance with Claim 3, it is well known and admitted by the Applicants that any weighting methodology can be used to produce an effect desired by the operator. Thus, in the absence of any teaching regarding the

criticality of using equal weighting values as opposed to unequal weighting values, it is considered by the Examiner to have been a matter of design choice at the time of the invention to use equal weighting of the scan lines as one of the options for processing the video data.

Regarding Claim 15, Poetsch discloses a system for forming a video output signal from anamorphic film comprising a raster scan generator system for scanning film at a non-anamorphic rate or greater (Column 1, Lines 44-54); a frame store having an input for receiving a digital image signal, an output for outputting multiple digital video signals, and an input for receiving an address (Figure 1, Item 16); and an address generator (Figure 1, Item 31). Poetsch does not disclose the selecting of nonadjacent scans by the address generator. However, the address generator of Poetsch can easily be modified to select nonadjacent scans for processing. This would enable the data obtained in the progressive scanning mode to be used to form a video output signal from anamorphic film data without having to change the scanning method. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the address generator of Poetsch to select nonadjacent scans and thus to enable the system to provide both anamorphic and non-anamorphic data without having to modify the scanning method. Poetsch also does not disclose a means for weighting the output

from the frame store, nor a summing means for combining the output of the weighting means with the output of the summing means forming the video output signal. However, Diermann et al. disclose a means for weighting video lines and a summing means for combining the output of the weighting means, with the output of the summing means forming the video output signal (Column 73, Lines 20-25). As mentioned in accordance with Claim 1, it is well known in the art that in creating video reproductions of film images, weighting and combining of video scan lines is required to provide corrective and/or enhancing processing of the video data derived from scanning of the film. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use, in the system of Poetsch the processing elements of Diermann et al. whereby weighting of video lines is performed and the weighted scan lines are summed to form the video output signal thus correcting and/or enhancing the video data.

Regarding claims 16-18, Poetsch does not disclose the memory as being a random access memory, a DRAM, or a VRAM. However, the Applicants admit that the memory can be "any known type of memory" (See Page 8, Line 13 of the disclosure). Thus, in the absence of any teaching regarding the criticality of using a particular kind of memory, it is considered by the Examiner to have been a matter of design choice at the time of the invention

to use as the memory device a random access memory, a DRAM, or a VRAM.

Regarding Claim 19, Poetsch discloses the use of a telecine for providing the digital image signal to the input of the frame store (Figure 1).

Regarding Claim 20, Poetsch does not disclose the frame store as comprising three separate frame stores. However, it is well known in the art that using multiple elements for video processing increases the operating speed of the system and provides greater flexibility in using the system. Whether or not to use multiple processing elements is a matter of design choice as admitted by the Applicants (See Page 8, Line 17). Thus, in the absence of any teaching regarding the criticality of using three separate frame stores as opposed to one frame store, it is considered by the Examiner to have been a matter of design choice at the time of the invention to use three separate frame stores for processing the video data.

(10) *New ground of rejection.*

This Examiner's Answer does not contain any new ground of rejection.

(11) *Response to argument.*

The Appellants argue that in Poetsch only half of the scanned information is stored and states that the "specification clearly discloses that the information for every other scan line is written over" (See page 6, lines 5-6). The Appellants (on page 7, lines 7-12) attempt to support this argument by quoting the portion of Poetsch set out at Column 6, Lines 41-45 which states:

> "The content of two lines is thus recorded in the same address in the memory. Consequently, the image content of the overall frame is reduced to half the number of lines for reproduction of the scene on the TV screen"

However, contrary to the interpretation of the Appellants that only half of the image data is stored in memory for use, this portion of Poetsch clearly states that what is stored in memory is "the image content of the overall frame". In other words, all of the data of the image frame is stored. This same teaching is found in other portions of Poetsch as well. For instance, in the Abstract it is stated that " a complete film frame is stored"; at Column 2, Lines 14-15 and 17-18 it is stated that "one film frame is completely scanned", and "one complete TV image is placed in the memory" (emphasis mine). In Poetsch, "the film.... is entirely scanned; (and) the image content is compressed about half of the image height" (Column 7, Lines 22-23). In other words, storage of a complete image is accomplished in half the

number of lines (Column 6, Lines 43-45). Data is not written over. Rather "the content of two lines is ...recorded in the same (line) address in the memory" (Column 6, Lines 41-43). Thus, although the Appellants are correct in noting that the same address is generated by the memory address control unit for two film scans (page 8, lines 7-8), the Appellants are incorrect in concluding that since the first scan and the second scan are both written to the same address in memory, the second scan writes over the preceding information (page 8, lines 9-11), and thus the Appellants are incorrect in stating that Poetsch teaches away from the present invention (page 11, lines 5-6).

The Appellants also contend that the Diermann reference is not relevant to disclosure of the processing means of the present invention since its teaching relates to the use of a comb filter for separation of chrominance and luminance information (page 11, lines 9-13) and not to the processing of lines of image data produced during conversion of images from film to an electronic format (page 11, lines 14-18). The Appellants thus surmise that the Examiner must have been led by the disclosure of the present invention to seek out the Diermann reference (page 11, lines 7-9). However, the Diermann reference demonstrates relevance on its own merits regarding its application to the device disclosed in Poetsch and in the present invention. For instance, Diermann's device uses signal processing circuits to operate on image

signals which have been stored in a memory unit in order to provide a color video output signal (Column 20, Lines 10-14). Poetsch discloses storing image signals in a memory unit (Column 3, Lines 14-20), and outputting a TV signal (Column 3, Line 24), but Poetsch is silent regarding the details of processing functions which operate on the stored image data in providing the output signal. Diermann discloses means for performing specific image processing functions, which are necessary in order to provide the output signal (Column 20, Line 67-Column 21, Line 5) and thus provides the information about which Poetsch is silent. One skilled in the art would recognize in Diermann, important information regarding the processing of stored image data for the purpose of producing Poetsch's output TV signal. Furthermore, Diermann's device is disclosed to be an improvement over former techniques which have been used to perform a telecine function (Column 3, Lines 7-13 and 35-58). Thus, one skilled in the art would recognize in Diermann a specific application related to performing a telecine function. Since both Poetsch and the present invention are applicable to a telecine operation, the Diermann device is clearly seen to be relevant.

The Appellants argue that the present invention is not directed to comb filters or any aspect of color signal format conversion (page 11, last line). However, as mentioned in the Final Office Action, the claim language does not distinguish from

the rejection in that the claimed processing of lines of an image signal does not preclude comb filtering (See Final Office Action, page 3). Furthermore, the kind of comb filtering disclosed in Diermann is known in the art to provide more than simply a color signal format conversion; it also accomplishes a signal processing function which results in a higher quality output signal. For instance, as also mentioned in the Final Office Action (page 3), Monta (U.S. Patent No. 5,161,006) uses comb filtering for separation of luminance and chrominance signals, a means which results in not only the desired separation but also results in a better chrominance signal (Column 3, Lines 14-21). Monta further discloses (Figure 10; Column 4, Lines 5-12) that when filtering such as that recited in the present invention is used (i.e. three consecutive lines with weightings of 1/4, 1/2, 1/4 respectively), the overall picture quality is improved. Therefore, it is clear that one skilled in the art would recognize in Diermann's comb filter the advantages of such a processing means for operating on the stored image data of Poetsch in order to produce an output TV image of improved quality. The Appellants contend that the successive video lines which Diermann combines are not separate scan lines of an image (See footnote on page 11). However, Diermann specifically refers to these lines as "television lines of a television field"

(Column 21, Lines 24-25) and "three successive television lines A, B and C of a field" (Column 73, Lines 15-16).

The Appellants further contend that there is no teaching or suggestion either to eliminate certain of the teachings of Poetsch nor to graft on those teachings of Diermann (page 12, section E.). In response to the Appellants' argument that there is no suggestion to combine the references, the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. In re Nomiya, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. In re McLaughlin, 170 USPQ 209 (CCPA 1971). references are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. In re Bozek, 163 USPQ 545 (CCPA) 1969. In this case, as mentioned previously, Diermann discloses processing features about which Poetsch is silent but which are well known in the art to produce a TV signal from stored image data and which also improve the quality of the signal. The Appellants state that the Examiner "leaps to the conclusion of obviousness" (page 12, last line) without the required express

citation of the reason, suggestion, or motivation found in the prior art (page 13, lines 9-10). However, an express citation of the reason, suggestion, and motivation for combining Diermann with Poetsch is presented by the Examiner on page 5 of the Final Office Action. The reason for combining comes from the fact that Diermann discloses a processing means about which Poetsch is silent but which those skilled in the art know is necessary to produce an output TV signal from Poetsch's device. The suggestion to combine is seen in the nature of Diermann's filtering means, a filtering means which is known in the art to result in enhanced image quality. The motivation to combine is found in the awareness which the skilled artisan would possess that by using the processing means of Diermann in the device of Poetsch, the image which is output from the Poetsch device will be of improved quality. That this kind of image processing (and variations thereof) is widely known is seen not only in the Monta reference cited earlier but also by the following references, which are only examples of the use and variations of similar filtering means which are known in the art:

- Campbell (U.S. Patent No. 5,136,385) - Three successive vertical pixels are processed so as to reduce flicker (Figure 4; Column 1, Lines 53-57).

- Blanchard et al. (U.S. Patent No. 4,646,133) - Comb filtering using three scan lines reduces the chroma noise factor by 50 percent (Column 1, Lines 24-29) and provides an improved video display (Column 1, Lines 53-59).

- Pritchard et al. (U.S. Patent No. 4,616,251) - Comb filtering provides not only a separated luminance and chrominance signal but also an interpolated signal which results in vertical enhancement of the image (Column 5, Lines 37-39, 59-62).

- Casavant et al. (U.S. Patent No. 5,384,599) - In converting from interlace to progressive scan, missing lines are reconstructed by taking the vertical average of the lines above and below the line being reconstructed. In so doing, recovery of information which would have otherwise been lost is permitted (Column 5, Lines 1-17).

It is clear that one skilled in the art would both recognize Diermann's comb filter as one of a number of similar filtering means which improve image quality, and understand the advantages of such a processing means for operating on the stored image data of Poetsch in order to produce an output TV image of improved quality.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Andy Christensen
Patent Examiner

ac
June 1, 1995

MICHAEL T. RAZAVI
SUPERVISORY PATENT EXAMINER
GROUP 2500

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Andy Christensen
Patent Examiner

ac
June 1, 1995

MICHAEL T. RAZAVI
SUPERVISORY PATENT EXAMINER
GROUP 2600